

REMARKS

In the Final Office Action, Claims 17-26 were examined and stand rejected. In response to the Final Office Action, Claim 17 is amended, no claims are cancelled and Claims 27-29 are added. Applicants respectfully request reconsideration of pending Claims 17-29, in view of the following remarks.

I. Claims Rejected Under 35 U.S.C. §102

Applicants respectfully assert that the Patent Office has failed to adequately set forth a *prima facie* rejection under 35 U.S.C. §102(b). “Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, *arranged as in the claim.*” *Lindemann Maschinenfabrik v. American Hoist & Derrick* (“Lindemann”), 730 F.2d 452, 1458 (Fed. Cir. 1994)(emphasis added). Additionally, each and every element of the claim must be exactly disclosed in the anticipatory reference. *Titanium Metals Corp. of American v. Banner* (“Banner Titanium”), 778 F.2d 775, 777 (Fed. Cir. 1985).

The Patent Office rejects Claims 17, 18, 21 and 25 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,795,821 issued to Bacchetta et al. (“Bacchetta”). To the extent that the rejection applies to the amended claims, Applicants respectfully traverse this rejection.

Regarding Claim 17, Claim 17 is amended to include the following claim feature, which is neither taught nor suggested by Bacchetta or the references of record:

an oxide layer formed directly on a surface of the substrate;
an adhesion layer formed on a surface of said oxide layer. (Emphasis added.)

According to the Patent Office, Claim 17, prior to amendment, is taught with reference to FIG. 1 of Bacchetta. Applicants respectfully disagree with the Patent Office’s contention. Apposite to Applicants’ Claim 17, Bacchetta teaches:

In accordance with the invention, a thin film layer of an oxide (silicon dioxide in the preferred embodiment) is formed at the interface between a first layer of a dielectric material and a successive layer of dielectric material, specifically silicon oxynitride and/or silicon nitride. This intermediate oxide acts as an adhesion layer between the two superimposed layers. (Col. 3, lines 43-49.) (Emphasis added.)

Accordingly, as illustrated with reference to FIG. 1 of Bacchetta:

[A] protective dielectric material layer 1 is usually formed over that structure . . . Thereafter, one or more dielectric material layers are formed in succession, shown at 3 in FIG. 1 . . . The dielectric layers 1 and 3 usually comprise silicon oxynitride or silicon nitride. (Col. 3, lines 57-64.)

In other words, as is illustrated with reference to FIG. 1 of Bacchetta:

The layer 2 provides an adhesive layer between the layers 1 and 3, and serve no specific passivation function. (Col. 4, lines 9-10.)

Hence, as illustrated in FIG. 1 of Bacchetta, oxide layer 2, as taught by Bacchetta, provides an adhesive layer between dielectric layers 1 and 3. Conversely, Claim 17, as amended, requires an oxide layer formed directly on a surface of the substrate. In fact, Bacchetta teaches interposing of thin oxide layer 2 before the second dielectric layer 3 is formed. (See col. 4, lines 2–4.)

Furthermore, Claim 17, as amended, requires an adhesion layer formed on a surface of the oxide layer. Conversely, Bacchetta teaches an adhesion layer formed between dielectric layers 1 and 3, as illustrated with reference to FIG. 1 of Bacchetta. Hence, Applicants respectfully submit that Bacchetta fails to teach each of the above-described features of Claim 17, as amended.

However, the case law is quite clear in establishing that each and every element of a claim must be exactly disclosed in the anticipatory reference. *Id.* Accordingly, Applicants respectfully submit that Applicants' amendment of Claim 17 prohibits the Patent Office from establishing a *prima facie* case of anticipation of Claim 17 under 35 U.S.C. §102(b). Consequently, Applicants respectfully request that the Patent Office reconsider and withdraw the §102(b) rejection of Claim 17.

Regarding Claims 18 and 21, Claims 18 and 21 depend from Claim 17 and therefore include the patentable claim features of Claim 17, as described above. Accordingly, Claims 18 and 21, based on their dependency from Claim 17 and for at least the reasons described above, are also patentable over Bacchetta, as well as the references of record. Consequently, Applicants respectfully request that the Patent Office reconsider and withdraw the §102(b) rejection of Claims 18 and 21.

II. Claims Rejected Under 35 U.S.C. §103

The Patent Office rejects Claim 19 under 35 U.S.C. §103(a) as obvious over Bacchetta in view of U.S. Patent No. 5,795,833 issued to Yu et al. ("Yu"). Applicants respectfully traverse the Patent Office's rejection.

After careful review of Yu, Yu fails to rectify the deficiencies attributed to Bacchetta in failing to teach or suggest formation of an adhesion layer on a surface of the oxide layer, where the oxide layer is formed directly on the surface of a substrate, as required by Claim 17, as amended. Assuming, *arguendo*, that Yu discloses a silicon oxide layer, Applicants respectfully submit Yu fails to teach or suggest an adhesion layer between a first passivation layer and an oxide layer, where the oxide layer is formed directly on the surface of a substrate, as required by Claim 17, as amended.

Accordingly, Claim 17 is patentable over Bacchetta in view of Yu, as well as the references of record. Hence, Claim 19, based on its dependency from Claim 17, is also patentable over Bacchetta in view of Yu, for at least the reasons described above. Consequently, Applicants

respectfully request that the Patent Office reconsider and withdraw the §103(a) rejection of Claim 19.

The Patent Office rejects Claim 20 under 35 U.S.C. §103(a) as obvious over Bacchetta in view of Japanese Patent No. 361292964 issued to Oshika et al. (“Oshika”). Applicants respectfully traverse the Patent Office’s rejection

Applicants respectfully submit that the Patent Office’s citing of Oshika fails to rectify the deficiencies attributed to Bacchetta in failing to teach or suggest an adhesion layer formed on a surface of said oxide layer, where the oxide layer is formed directly on the surface as a substrate. Accordingly, even assuming, *arguendo*, that Oshika teaches an adhesion layer including silicon oxynitride, as required by Claim 20, Applicants respectfully submit that Oshika does not teach formation of the adhesion layer between a first passivation layer and an oxide layer, where the oxide layer is formed directly on the surface of a substrate, as required by Claim 17.

Accordingly, Claim 17, as amended, is not anticipated by either Bacchetta or Oshika, whether viewed independently or in combination. Consequently, Claim 20, based on its dependency from Claim 17, and for at least the reasons described above, is also patentable over Bacchetta, Oshika and the references of record. Therefore, Applicants respectfully request that the Patent Office reconsider and withdraw the §103(a) rejection of Claim 20.

The Patent Office rejects Claim 22 under 35 U.S.C. §103(a) as obvious over Bacchetta in view of U.S. Patent No. 5,807,787 issued to Fu et al. (“Fu”). Applicants respectfully traverse the Patent Office’s rejection.

Applicants respectfully submit that the Patent Office’s citing of Fu fails to rectify the deficiencies attributed to Bacchetta’s failure to teach an adhesion layer formed on a surface of an oxide layer, where the oxide layer is formed directly on the surface of a substrate. Accordingly, even assuming, *arguendo* that Fu teaches said second passivation layer includes polyimide, as required by Claim 22, the combination of Bacchetta in view of Fu, whether viewed independently or in combination, fail to teach or suggest each of the features of Claim 17, as amended.

Accordingly, Claim 17, as amended, is also patentable over Bacchetta in view of Fu, as well as the references of record. Consequently, Claim 22, based on its dependency from Claim 17, and for at least the reasons described above, is also patentable over Bacchetta, Fu and the references of record, whether viewed alone or in combination. Therefore, Applicants respectfully request that the Patent Office reconsider and withdraw the §103(a) rejection of Claim 22.

The Patent Office rejects Claims 23 and 26 under 35 U.S.C. §103(a) as obvious over Fujitsu in view of U.S. Patent No. 4,426,234 issued to Ohshima et al. (“Ohshima”). Applicants respectfully traverse the Patent Office’s rejection.

Regarding Claim 23, Claim 23 includes the following claim feature, which is neither taught nor suggested by either Fujitsu, Ohshima or the references of record:

a silicon nitride hard passivation layer formed directly on a surface of said silicon oxynitride adhesion layer.

As correctly noted by the Patent Office, Fujitsu fails to teach the above feature of Claim 23. Accordingly, the Patent Office cites Ohshima, which according to the Patent Office teaches a silicon nitride layer directly on a surface of said silicon oxynitride layer. According to the Patent Office:

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Fujitsu to include a silicon nitride layer directly on a surface of said silicon oxynitride layer as disclosed in Ohshima because it aids in preventing the out diffusion of an impurity (For Example: See Column 2 Lines 8-24) (See Final Office Action, pp. 5-6.)

Applicants respectfully disagree with the Patent Office's contention.

In fact, Applicants respectfully submit that one skilled in the art would not modify Fujitsu to include a silicon nitride layer directly on a surface of the silicon oxynitride layer in order to prevent "out diffusion" of impurities, since Fujitsu provides no teachings or suggestions with reference to ion implanting.

In other words, Applicants respectfully submit that the teachings of Fujitsu are limited to a silicon substrate having a silicon dioxide film including an oxynitride film formed on at least the surface of the silicon dioxide film. Similarly, Ohshima teaches, with references to FIGS. 2A-2C, a first thin film formed on an entire surface of a substrate 10 and a second thin film formed on the entire surface of the first thin film 11. (See col. 2, lines 8-15.)

As further described within Ohshima

the first thin film may be comprised of silicon oxynitride or polycrystalline silicon. Likewise, the second thin film may be made of aluminum oxide, silicon carbide, or silicon oxynitride. (See col. 2, lines 15-20.)

Accordingly, Applicants respectfully submit that in one embodiment, Fujitsu and Ohshima provide a similar teaching of a first thin film of silicon dioxide formed on a substrate having a second thin film of silicon oxynitride formed on the first thin film. Conversely to Fujitsu, Ohshima also teaches a first thin film of silicon oxynitride having a second thin film formed over the first thin film where the second thin film is silicon nitride.

Although both Fujitsu and Ohshima teach first and second films formed over a substrate, according to the Patent Office, Fujitsu may be modified to include a third layer of silicon nitride over a second layer of silicon oxynitride. According to the Patent Office, one skilled in the art would combine the features of Fujitsu in view of Ohshima in order to prevent out diffusion.

However, Applicants respectfully submit that Fujitsu is not directed to impurity implanting. Hence, one skilled in the art viewing Fujitsu would not be concerned with preventing out diffusion of impurities since Fujitsu is not directed to implanting of impurities.

Conversely, Ohshima teaches that:

The second thin film 12 is formed to prevent the out diffusion of an impurity which is to be ion implanted in a step to be performed later . . . Next, as shown in FIG. 2B, an impurity such as Ga is ion implanted into the first thin film to the second thin film. (See col. 2, lines 20-27.)

Accordingly, Applicants submit that one skilled in the art would not modify Fujitsu, as proposed by the Patent Office, since neither the skill in the art nor the teachings of either Fujitsu or Ohshima would provide a suggestion or teaching of the proposed combination.

Accordingly, Applicants respectfully submit that the features of Claim 23 could only be arrived at through inappropriate hindsight. However, it is well established that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent the teaching or suggestion supporting such combination. ACS Hospital Sys., Inc. v. Montefiore Hospital, 732 F.2d. 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Also, one cannot find obviousness through hindsight to construct a claimed invention from elements of the prior art. In re Warner, 379 F.2d 1011, 1016, 154 U.S.P.Q. 173, 177 (C.C.P.A. 1967).

Therefore, Applicants respectfully submit that a *prima facie* case of obviousness of Claim 23 over Fujitsu in view of Ohshima is not established due to the fact that the Patent Office fails to illustrate a teaching or suggestion to combine the reference teachings. Accordingly, Claim 23 is patentable over Fujitsu, Ohshima and the references of record. Consequently, Applicants respectfully request that the Patent Office reconsider and withdraw the §103(a) rejection of Claim 23.

The Patent Office rejects Claim 24 under 35 U.S.C. §103(a) as obvious over Fujitsu in view of Ohshima and U.S. Patent No. 5,698,456 issued to Bryant et al. ("Bryant"). Applicants respectfully traverse the Patent Office's rejection.

Regarding Claim 24, Claim 24 depends from Claim 23 and therefore includes the patentable claim features of Claim 23, as described above. Furthermore, Applicants respectfully submit that the Patent Office's citing of Bryant fails to rectify the deficiencies attributed to the combination of Fujitsu in view of Ohshima for failing to teach a silicon nitride hard passivation layer formed on a surface of said silicon nitride oxynitride adhesion layer, as required by Claim 23, as amended.

Accordingly, Applicants respectfully submit that Claim 24, based on its dependence from Claim 23, and for at least the reasons described above, is also patentable over Fujitsu, Ohshima and Bryant, whether viewed independently or in combination. Consequently, Applicants respectfully request that the Patent Office reconsider and withdraw the §103(a) rejection of Claim 24.



III. New Claims

Regarding new Claims 27-29, new Claims 28 and 29 depend from Claim 27, which includes the following claim feature, which is neither taught nor suggested by the references of record:

wherein each of the first layer, the second layer, and the third layer are distinguishable,

wherein the second layer is disposed between the first layer and the third layer, and

wherein the second layer and the third layer comprise one common chemical element.

Applicants respectfully submit that the above features of Claim 27 render Claim 27 patentable over the references of record. In addition, Claims 28 and 29, based on their dependency from Claim 27, are also patentable over the references of record. Consequently, Applicants respectfully request that the Examiner allow new Claims 27-29.

CONCLUSION

In view of the foregoing, it is believed that all claims now pending patentably define the subject invention over the prior art of record and are in condition for allowance, and such action is earnestly solicited at the earliest possible date.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17, particularly, extension of time fees.

Respectfully submitted,

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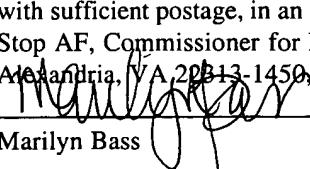
Dated : April 26, 2004

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Marilyn Bass

April 26, 2004